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| **Unit Title:** Patterns and Algebra | **Pacing (Duration of Unit):** 3 Weeks |

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| **Desired Results** |

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| **Transfer Goals (**Priority practice standards in **bold)** |
| *Students will be able to independently use their learning to:*   1. **Make sense of problems and persevere in solving them.** 2. **Reason abstractly and quantitatively.** 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. **Attend to precision.** 7. **Look for and make use of structure.** 8. Look for and express regularity in repeated reasoning. |

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| **Established Goals (2011 MA Curriculum Frameworks Standards Incorporating the Common Core State Standards)** |

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| **Prerequisite Standards:**   * 4.OA.1: Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations. * 4.OA.2: Multiply or divide to solve word problems involving multiplicative comparison*,* e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison*.*24 * 4.OA.3: Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness * 4.OA.5: Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers.* * 4.G.1:Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures. | **WIDA for English Language Learners**  Standard 1: ELLs **communicate** for **Social** and **Instructional** purposes within the school setting  Standard 3: ELLs **communicate** information, ideas and concepts necessary for academic success in the content area of **Mathematics** |
| **Standards** (Priority Standards in **bold**):   * 5.G.1: Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., *x*-axis and *x*-coordinate, *y*-axis and *y*-coordinate). * **5.G.2: Represent real-world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.** * **5.OA.1: Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.** * 5.OA.2: Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation “Add 8 and 7, then multiply by 2” as 2* × (*8 + 7*)*. Recognize that 3* × (*18932 + 921*) *is three times as large as 18932 + 921, without having to calculate the indicated sum or product.* * **5.OA.3: Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule “Add 3” and the starting number 0, and given the rule “Add 6” and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*** | In the lesson planning stage, teachers will need to differentiate lessons for ELLs. In order to accomplish this they will need: 1.) this curriculum map, 2.) a list of their ELLs and their proficiency levels, and 3.) appropriate language function expectations and scaffolds or supports. |

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| **Meaning (\*Mostly assessed through Performance Tasks/Assessments)** |

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| **Big Ideas:** (Statements and concepts written in teacher friendly language which reflect the important [but not obvious] generalizations we want students to be able to arrive at. These are used by the teacher to focus daily instruction.)   * The order of operations is needed to evaluate expressions involving addition, subtraction, multiplication, division and grouping symbols (parentheses/brackets/braces). * A graph on the coordinate grid can represent real life contexts. * On a graph, a point represents the two facets of information associated with an ordered pair. | **Essential Questions:** (Questions which frame ongoing and important inquires about the big ideas. They are written for students and used in daily instruction to help engage students in meaningful thinking.)   * How do coordinate grids help you organize information? * How can we use numerical expressions to represent real-life situations? |

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| **Acquisition (\*Mostly assessed through traditional summative assessments)** | |
| **Knowledge:** Key basic concepts, facts, and key terms (written in phrases) students should be able to recall independently.  ***Students will know…***   * That there is a standard Order of Operations that we all agree is the correct way to evaluate expressions. The order is totally arbitrary and is just something that we as mathematicians agree to so that there is agreement on the correct solution. * Data is represented by ordered pairs, tables and/or graphs.   **Key Academic Vocabulary:**   * Ordered pair * Coordinate Plane/Coordinate System * Order of operations * Parentheses (), Brackets [], Braces {} * Quadrant * Origin * X-axis, Y-axis * Horizontal * Vertical * Variable * Coordinates * Point * Intersection * Perpendicular * Graph | **Skills:** The discrete skills and process students should be able to use independently  *Students will be skilled at:*   * Generating patterns using given rules. * Identifying relationships between variables. * Graphing ordered pairs in the first quadrant of the coordinate plane. * Naming and writing ordered pairs using the correct notation. * Interpreting what a coordinate on a graph means in the context of situations. * Writing and evaluating numerical expressions using Order of Operations. |

**Resource Suggestions:**

**Rules/patterns** [**http://pbskids.org/cyberchase/math-games/stop-creature/**](http://pbskids.org/cyberchase/math-games/stop-creature/)

**Interactive Games** [**http://interactivesites.weebly.com/math.html**](http://interactivesites.weebly.com/math.html) *(Click on unit topic)*

**Common Core Georgia Performance Standards:** Order of Operations & Expressions

**Common Core Georgia Performance Standards:** Generate & Graph Numerical Patterns

**Illustrative math** <http://www.illustrativemathematics.org/5>

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| [**Standard(s)**](http://www.illustrativemathematics.org/5) | [**Link**](http://www.k-5mathteachingresources.com/5th-grade-number-activities.html) |
| 5.OA.1 | [Picturing Factors in Different Orders](http://www.illustrativemathematics.org/illustrations/1630) |
| 5.OA.1 | [You Can Multiply Three Numbers in Any Order](http://www.illustrativemathematics.org/illustrations/1631) |
| 5.OA.1 | [Watch Out for Parentheses 1](http://www.illustrativemathematics.org/illustrations/555) |
| 5.OA.1 | [Bowling for Numbers](http://www.illustrativemathematics.org/illustrations/969) |
| 5.OA.1 | [Using Operations and Parentheses](http://www.illustrativemathematics.org/illustrations/1596) |
| 5.OA.2 | [Words to Expressions 1](http://www.illustrativemathematics.org/illustrations/556) |
| 5.OA.2 | [Video Game Scores](http://www.illustrativemathematics.org/illustrations/590) |
| 5.OA.2 | [Comparing Products](http://www.illustrativemathematics.org/illustrations/139) |
| 5.OA.2 | [Seeing is Believing](http://www.illustrativemathematics.org/illustrations/1222) |
| 5.G.1 | Battle Ship Using Grid Paper |
| 5.G.2 | Meerkat Coordinate Plane Task |

**K-5 Math Resources** <http://www.k-5mathteachingresources.com/5th-grade-number-activities.html>

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| **Standard(s)** | **Link** |
| 5.OA.1 | [Target Number Dash](http://www.k-5mathteachingresources.com/support-files/targetnumberdash5.oa1.pdf) |
| 5.OA.1 | [Numerical Expressions Clock](http://www.k-5mathteachingresources.com/support-files/numercialexpressionswallclock.pdf) |
| 5.OA.2 | [Verbal Expressions](http://www.k-5mathteachingresources.com/support-files/5.oa2.pdf) |
| 5.OA.3 | [Function Table and Graph Template](http://www.k-5mathteachingresources.com/support-files/functiontableandgraph.pdf) |
| 5.OA.3 | [Function Table and Coordinate Plane Paper](http://www.k-5mathteachingresources.com/support-files/functiontableandcoordinategridpaper.pdf) |
| 5.OA.3 | [Addition on the Coordinate Plane](http://www.k-5mathteachingresources.com/support-files/additiononthecoordinateplane.pdf) |
| 5.OA.3 | [Subtraction on the Coordinate Plane](http://www.k-5mathteachingresources.com/support-files/subtractiononthecoordinateplane.pdf) |
| 5.G.1 | [Coordinate Grid Geoboards](http://www.k-5mathteachingresources.com/support-files/coordinategridgeoboards.pdf) |
| 5.G.1 | [Coordinate Shapes](http://www.k-5mathteachingresources.com/support-files/coordinateshapes.pdf) |
| 5.G.1 | [Coordinate Grid Swap](http://www.k-5mathteachingresources.com/support-files/coordinategridswap.pdf) |
| 5.G.1 | [Coordinate Grid Tangram](http://www.k-5mathteachingresources.com/support-files/coordinategridtangram.pdf) |
| 5.G.1 | [Assorted Coordinate Grid Paper](http://www.k-5mathteachingresources.com/support-files/coordinategridpaperset.pdf) |
| 5.G.2 | [Geometric Shapes on the Coordinate Grid](http://www.k-5mathteachingresources.com/support-files/geometricshapesonthecoordinategrid.pdf) |

**Technology (videos)**

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| **Standard(s)** | **Link** |
| 5.OA.1 | [**Video: Evaluating Expressions with Parentheses, Braces and Brackets**](http://hoodamath.com/tutorials/5thgrade/Evaluating_Expressions_with_Parentheses_and_Braces_and_Brackets.php)  [**http://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-expressions-and-variables/cc-6th-order-operations**](http://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-expressions-and-variables/cc-6th-order-operations) |
| 5.OA.2 | [**Video: Interpreteing Numberical Expressions**](http://hoodamath.com/tutorials/5thgrade/Interpreting_Numerical_Expressions_by_Writing_them_in_Sentences.php) |
| 5.G.2  5.OA.1 | [**Video: Charting Order Pairs**](http://hoodamath.com/tutorials/5thgrade/Generating_Numerical_Patterns_and_Forming_Ordered_Pairs_by_using_Rules.php) |
| 5.OA.3 | [**Online Tutorial: Sequences - Finding a Rule**](http://www.mathsisfun.com/algebra/sequences-finding-rule.html) |
| 5.G.1 | [**http://www.khanacademy.org/math/cc-fifth-grade-math/cc-5th-geometry-topic/cc-5th-coordinate-plane**](http://www.khanacademy.org/math/cc-fifth-grade-math/cc-5th-geometry-topic/cc-5th-coordinate-plane) |
| 5.G.2 | [**http://www.khanacademy.org/math/cc-fifth-grade-math/cc-5th-geometry-topic/cc-5th-coordinate-plane**](http://www.khanacademy.org/math/cc-fifth-grade-math/cc-5th-geometry-topic/cc-5th-coordinate-plane) |
| 5.OA.2 | [**http://www.khanacademy.org/math/cc-fifth-grade-math/cc-5th-algebraic-thinking/cc-5th-writing-expressions-tut**](http://www.khanacademy.org/math/cc-fifth-grade-math/cc-5th-algebraic-thinking/cc-5th-writing-expressions-tut)  [**http://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-expressions-and-variables/cc-6th-writing-expressions**](http://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-expressions-and-variables/cc-6th-writing-expressions) |
| 5.OA.3 | [**http://www.khanacademy.org/math/cc-fifth-grade-math/cc-5th-algebraic-thinking/cc-5th-number-patterns**](http://www.khanacademy.org/math/cc-fifth-grade-math/cc-5th-algebraic-thinking/cc-5th-number-patterns)  [**http://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-expressions-and-variables/cc-6th-super-yoga**](http://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-expressions-and-variables/cc-6th-super-yoga)  [**http://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-expressions-and-variables/cc-6th-beginner-equations**](http://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-expressions-and-variables/cc-6th-beginner-equations) |

**GO MATH**

**STANDARDS:** 5G1; **5G2; 5OA1;** 5OA2; **5OA3**

**bold print: priority standards**

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| **STANDARDS** | **LESSON #** | **TITLE** |
| 5G1 | 9.2 | Ordered Pairs |
| **5G2** | **9.3** | **Investigate - Graph Data** |
| **5G2** | **9.4** | **Line Graphs** |
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| 5OA2 | 1.10 | Numerical Expressions |
| **5OA1** | **1.11** | **Algebra - evaluate Numerical Expressions** |
| **5OA1** | **1.12** | **Algebra - Grouping Symbols** |
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| **5OA3** | **9.5** | **Numerical Patterns** |
| **5OA3** | **9.6** | **Problem Solving - Fins a Rule** |
| **5OA3** | **9.7** | **Graph & Analyze Relationships** |